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ECKING PREPACKAGED COMMODITIES

Manual for Weights and Measures Officials

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TIONAL BUREAU OF STANDARDS

NDBOOK 67

U.S. DEPARTMENT OF COMMERCE

NATIONAL BUREAU OF STANDARDS

CHECKING PREPACKAGED COMMODITIES

A Manual for Weights and Measures Officials

Malcolm W. Jensen

NATIONAL BUREAU OF STANDARDS

HANDBOOK 67

U.S. DEPARTMENT OF COMMERCE • Lewis L. Strauss, Secretary

NATIONAL BUREAU OF STANDARDS • A. V. Astin, Director

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Preface

This publication is the fifth in the series of Handbooks of the National Bureau of Standards designed to present in compact form comprehensive guides for State and local weights and measures officials.

This Handbook presents an operational guide for the control, under law, of prepackaged commodities. It includes information on equipment, techniques, action, reporting, and as an appendix, a comprehensive table that will facilitate the checking of total selling price extensions when these are based on stipulated unit prices.

Authority for such activity on the part of the Bureau is found in basic legislation (64 Stat. 371) wherein the Bureau is authorized to undertake, among others, the following functions: "Cooperation with the States in securing uniformity in weights and measures laws and methods of inspection," and "The compilation and publication of general scientific and technical data resulting from the performance of the functions specified herein or from other sources when such data are of importance to scientific or manufacturing interests or to the general public, and are not available elsewhere * * *."

This Handbook has been published in "pocket" size to further its usefulness to the official and facilitate the adaptation of the price-computation tables to field inspection.

Although the publication has been prepared primarily for use by weights and measures officials of the States, counties, and cities, it is believed that the information presented will be useful to persons employed by commercial and industrial establishments involved in the packing, distributing, and retailing of packaged commodities.

A. V. Astin, *Director.*

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CHECKING PREPACKAGED COMMODITIES

Malcolm W. Jensen

A manual for State and local weights and measures officials, describing a method for controlling various types of prepackaged commodities.

1. INTRODUCTION

There is presented here a method of control of prepackaged commodities (commodities put up in packages in advance of being offered for sale) for use by State and local weights and measures officials—a method based on two concepts:

(1) Variations in quantities of packages are not permitted to such extent that the averages of the quantities in the packages comprising a lot, shipment, or delivery is below the quantity stated, and an unreasonable shortage in any individual package is not acceptable, even though overages in other packages in the same lot, shipment, or delivery compensate for such shortages. (This is the basic quantity requirement of the Model Regulation for Prepackaged Commodities adopted by the National Conference on Weights and Measures and of the Federal Food and Drug Administration.)

(2) Perfection in either mechanical devices or human beings has not yet been attained; thus the existence of imperfection *must* be recognized and allowances for such imperfection must be made. These allowances are recognized in the "average" concept.

2. GENERAL CONSIDERATIONS

The control of the accuracy of quantity in packages is a specialized, yet extremely vital, phase of weights and measures administration.

Obviously the mere assurance of accurate mechanical equipment is only the foundation of weights and measures control, the culmination of which is the assurance of accurate quantity representations to the consumer through official supervision over the use of the weighing and measuring devices.

Special equipment is required for package-quantity checking, and the personnel assigned to this phase of the weights and measures program must receive special training. Although it is not inappropriate to conduct package-checking

procedures in conjunction with and during the store visits made for the primary purpose of scale testing, major efforts in package checking will be most effective if they are separated from other phases of the weights and measures enforcement program. For a sustained program of package checking in a large jurisdiction, it is suggested that the very best results will be obtained if this activity is carried on by trained specialists who concentrate on this type of work.

The inspector assigned principally to mechanical inspections and only as a side line to package checking will normally execute this phase of his work in the retail stores. Occasionally even he will find it advantageous to check packages at wholesale distributors and even, in special circumstances, at the establishment of the manufacturer or packer. The specialist assigned full time to this work will find that much of his activity is carried on at the locations of the distributors and the packers in his jurisdiction. He will "run down" reports of package inaccuracies reported by other inspectors and, on his own initiative, spot-check distributors of packaged merchandise.

The primary object of the inspector in this field is to see that quantity is accurately represented to the ultimate purchaser—the consumer; nevertheless, he may be of very real service to the manufacturer, distributor, and retailer if he is able to identify the exact point at which any shortages begin to appear.

Certain packaged products distributed through the normal packer-to-distributor-to-retailer channel are subject to gain or loss of weight through the increase or decrease in moisture content, beginning immediately after the packaging occurs.

The Model Regulation provides that "variations from the stated weight or measure shall be permitted when caused by ordinary and customary exposure * * * to conditions which normally occur in goood distribution practice and which unavoidably result in change of weight or measure." The distribution point after which such shrinkage losses are permitted is a statutory or regulatory provision that varies among the States.

It is admitted that such indefinites as "ordinary and customary exposure" and "good distribution practice" are difficult to set forth quantitatively; thus the experience and judgment of the inspector must be relied upon. He will learn to compare various environments and various systems of distribution and storage. As the result of his experience he will be able to develop procedures for conducting a sound investigation that will result in the building up of a working knowledge as to what is "customary exposure" and what may be con-

sidered to be "good distribution practice" with respect to the packages of an individual commodity that may gain or lose weight through gain or loss of moisture.

To be truly adequate, a package-checking program must be extensive with respect to the relative time spent, and diversified with respect to the types of packages checked. General coverage of the packages offered for sale in the jurisdiction is the key to adequacy and appropriateness. A program should not be directed to a single type of package, such as fresh meats in self-service markets, or even to a few types. Packages distributed through interstate commerce, canned peas and bottled vinegar, for example, should receive a proportionate share of attention.

Although a weights and measures administrator will direct concentration on specific items for special surveys or to correct quickly faults that have been discovered, he will plan the general program so as to "sample" all areas of commodities sold in packages.

3. CLASSES OF PREPACKAGED COMMODITIES

There are two distinct classes of prepackaged commodities—"random" packages, representing packages of a single commodity in a variety of random sizes which in most cases are put up in the retail store, and "standard-pack" packages, representing packages of a single commodity put up in selected sizes. Within the standard-pack class there are two categories, those packages sold by weight and those sold by liquid measure. Although in certain respects the operations in regard to "random" and "standard-pack" packages differ, the equipment used for the checking and the approach to the checking activity are similar in each case.

4. EQUIPMENT

In the belief that the testing equipment used by a weights and measures official should be, insofar as practicable, "standard" equipment designed especially for and restricted to official use and tested regularly and completely controlled by the official, the procedures described here will, for the most part, involve the use of special equal-arm package-reweighing scales and standard test weights. It is recommended that the first such scale required for this work be one of nominal 3-pound (actual, with careful use, 10-

pound) capacity, with center tower and side bar. The tower should show zero in the center and 1 ounce divided into $\frac{1}{16}$ ounce on each side of zero. The side bar also should have zero in the center, with at least 2 ounces divided into $\frac{1}{8}$ ounce on each side of zero. The scale should be fitted with locking devices to hold the lever during transit and with a handle for carrying, and should be provided with a protective cover or box.

For the checking of larger packages, such as hams, turkeys, potatoes, apples, and the like, a similar equal-arm scale with capacity of at least 50 pounds is recommended; however, until such a scale is provided, an approved commercial scale in regular use in a market will be satisfactory. Likewise, scales of even larger capacities, platform beam for example, will be used in the checking of 50- and 100-pound bags of produce, feed, seed, and the like. Whenever commercial scales are used by the inspector, the weighing of the packages should be done by the "substitution" method (see 9.1, Step 1 (b), below)—that is, substituting on the scale standard weights in an amount equal to the declared weight of the package and thus using the scale only as an indicator. The commercially used scale should not be used by the inspector for direct readings of package weights.

Standard weights employed by the official during check-weighing procedures may be the same as or similar to those used in testing scales. Normally a total of 30 pounds, with denominations down to $\frac{1}{16}$ ounce in the customary system and 0.001 pound in the decimal system, is adequate for small packages, and one 25-pound and two 50-pound test weights will be sufficient for most all large packages. Volumetric measures, ½ pint to 1 gallon (conical with slicker plates) and a 2-ounce cylindrical glass graduate graduated to ½ fluid dram, will be used in checking standard-pack packages sold by liquid measure.

5. POSITION FOR PACKAGE-CHECKING OPERATION

After the announcement of his presence, the official should select a suitable position for his package-checking operations. The principal requirement of the site is convenience—both to the inspector and to the store personnel and customers. If one that is in the customer area of the store yet out of the way of normal customer traffic can be found, it will be quite proper to perform the tasks in the view of the public. This tends to inform the casual onlookers as to one important

phase of the weights and measures program. Such activity also will represent good public relations for the store, if the packages being checked are found to be accurately labeled.

6. SAMPLE SELECTION

(*The word "sample" will be used herein to designate the small group of packages, usually 10, selected to represent a lot, shipment, or delivery.* In a storage area such as is found on the premises of a manufacturer, packer, distributor, and in some cases a retailer, the total inventory of a single item of merchandise in a single size may be found to contain 2 or more lots, each identifiable by a lot symbol. In these instances it is advisable to sample one or more of the individual lots and take action on such individual lot, independent of other lots of the same type package.)

With the location selected, it is advisable to decide, at least tentatively, the lots of prepackaged items that are to be checked (for example, hamburger, chuck roasts, pork chops, calf liver, sliced American cheese, Swiss cheese, cereal, canned beans, salt, and the like) and select the samples from those lots. There are two important considerations in the selection of samples. First, the sample should be of sufficient number to represent properly the lot from which it is taken, yet not so many as to require for a single lot a disproportionate amount of checking time; and second, the samples should be selected from various places in the lot—top, bottom, center, right, left, front, rear—again so that the lot is properly represented. Under normal conditions a sample of 10 will be adequate. A larger sample does not increase the reliability of the sample in an amount proportional to the increase. (An exception in the nature of a larger sample for very large lots is explained in Step 5 of the Checking Procedure, page 9.)

If practicable, all samples should be selected before the weighing of any is begun. This provides for checking the counter "as found," and avoids any possibility of packages being added to or removed from a lot that is to be checked during the time another lot is being checked, and thus disturbing the as-found condition.

7. SCALE TEST

Once the samples have been selected, the scale to be used in the checking procedure is made ready. If the packages are of such size that the equal-arm scale is to be used, the

scale must be placed on a firm support and should be leveled. The scale, itself, should be tested in the new environment. (A simple test is appropriate, such as a careful observation of zero-load indication, one or two equal loads on each pan, one small load to test the tower indicator and side bar, and a test for sensitiveness.) A test not only will assure the inspector that his device is operating properly; it will also convince any observers as to the care exercised by the weights and measures official in the conduct of his duties.

If the packages are large, the store scale that is to be used in the checking should be selected, both as to its physical condition and as to its convenience from the standpoint of the store personnel, and should be examined as to its appropriateness for the checking procedure. Such a scale obviously should be a "sealed" scale. It should be checked carefully for sensitiveness and should be used only if it is sufficiently sensitive to indicate clearly weight in the amounts that errors are to be defined. Once the scale has been selected, it should not be released to commercial service until the inspector's use of it has been completed.

8. CHECKING PROCEDURE

8.1. Random Packages (see also Section 9).—The checking procedure is designed to determine whether the average quantity of contents of the packages in a lot is at least equal to the average declared quantity, and also whether there exist any "unreasonably" large errors in the package labeling. This procedure develops such information through the determination of errors in individual packages. The step-by-step procedure for checking random packages follows:

Step 1. Checkweighing.—

(a) Equal-Arm Scale. Weigh each package of the sample representing a single lot by placing on one pan of the scale the package and on the other pan the tare, as represented by similar packaging material (essentially uniform packaging materials having been used for similar packages), and standard weights equal to the declared weight. Read the error as shown on the tower indicator, or tower indicator plus side bar graduations if the error is greater than the tower capacity, to the nearest $\frac{1}{16}$ ounce.

(b) "Substitution" Method. First "balance in" on the load-receiving element of the scale to be used, standard weights in small denominations sufficient in total weight to equal the largest plus error that might be expected in the packages to be weighed. Determine carefully the weight

of the packaging material, and then place on the load-receiving element of the scale standard weights in an amount equal to the tare weight plus the labeled weight. Note the exact indication of the scale (either automatically indicated or indicated by poise placement—with or without counterpoise weights—as the case may be). Remove these standard weights from the load-receiving element and place thereon a package to be weighed. Restore precisely the previously noted scale indication by adding or removing standard weights. The weights thus added or removed indicate the package error—*short* (minus) if weights are *added*, *over* (plus) if weights are *removed*.

Because some shortages in package weight are caused by the leaking of fluids from the commodity, and because certain packages are sufficiently watertight that they will hold such leaked fluid, it will be advisable to make special observation in certain instances. If a package containing a commodity suspected of leaking is transparent, and if any tray, cup, or other absorbent packaging material apparently has not absorbed any moisture, the package may be turned upside down so that any fluid will run to the transparent top and be easily seen. If fluid is apparent inside the package, or if the packaging material appears to be or to have been wet and soggy, the package should be opened and the net weight determined directly.

Step 2. Recording (see also Section 11).—Record the labeled weight and the error in $\frac{1}{16}$ ounce for each small package, or in an appropriate denomination for each large package. The zero errors (recorded as 0) and the plus errors are listed in one column, the minus errors in a second column. (See example, Step 5.)

Step 3. Unreasonable errors.—Circle errors that are "unreasonably" large, either plus or minus. The decision as to the unreasonableness of an error, though of necessity arbitrary, must be made and may be predicated, to a certain extent, on knowledge. Consideration should be given to (1) the allowable error in the commercial device employed in the packaging process, (2) the possible error in the scale used to check the packages, (3) anticipated reasonable human errors in both operations, and (4) the susceptibility of the packaged commodity to accurate weight control at the time of packaging. The table that follows is suggested for both random and standard-pack packages that contain items of such a nature that they are susceptible of precise weight control. Standard-pack packages of such commodities as apples, potatoes, and the like cannot be controlled as pre-

cisely as can packages of commodities such as peas, corn, sugar, salt, and flour; consequently the inspector must exercise greater liberality in the determination of the reasonableness or unreasonableness of errors in packages containing large individual elements.

(It will be noted that the suggested plus allowances are twice the suggested minus allowances at each "labeled quantity." This is an acknowledgment that packers must be allowed to overfill such packages as are susceptible of moisture loss.)

UNREASONABLE MINUS OR PLUS ERRORS

Labeled quantity	*Minus error Greater than*	*Plus error Greater than*
0 to 2 ounces	⅛ ounce	¼ ounce.
2+ to 8 ounces	3/16 ounce	⅜ ounce.
8 ounces+ to 2 pounds	¼ ounce	½ ounce.
2+ to 4 pounds	5/16 ounce	⅝ ounce.
4+ to 7 pounds	⅜ ounce	¾ ounce.
7+ to 14 pounds	½ ounce	1 ounce.
14+ to 24 pounds	¾ ounce	1½ ounces.
24+ to 36 pounds	1 ounce	2 ounces.
36+ to 51 pounds	8 ounces	1 pound.
51+ to 101 pounds	2 pounds	4 pounds.

The figures offered above are suggested for the determination of the "reasonableness" of errors in individual packages; they should not be used as tolerance figures.

Step 4. Action based on unreasonable errors.—Action should be taken with respect to the packages with unreasonable errors (either + or −); the following is suggested:

(a) If one package of the sample of 10 packages has an unreasonably large *minus* error, that package may be ordered repacked or relabeled, or may be held to constitute a violation of the statute and taken as evidence, at the discretion of the inspector.

(b) If there are in the sample of 10 packages 2 or more packages with unreasonably large *minus* errors, the *entire lot* should be held in violation, *without further calculation.* Appropriate action with respect to ordering off sale, prosecution, or the like should be taken. (See 10. Official Action.)

(c) If 3 or less of the sample of 10 packages have unreasonably large *plus* errors, these should be called to the attention of the market operator or the person responsible.

(d) If there are in the sample of 10 packages 4 or more packages with unreasonably large *plus* errors, this should be considered to show poor packaging practice, without further calculation. This situation should be called to the attention of the store operator, who should be instructed as to more precise weighing.

Step 5. Determination of average error.—Average errors should be determined for those lots on which conclusions have not been reached under (b) and (d) in Step 4 above. The average error is determined as follows:

(a) As in the example below, add the plus (+) errors, on the one hand, and the minus (−) errors, on the other hand—excluding from the sums the circled figures which represent unreasonably large errors. (The unreasonably large errors, both plus and minus, are excluded from the average, because they are acted upon individually and because their inclusion would destroy or alter the packaging "pattern." For example, a sample could show 9 packages each with a minus error of 1/16 ounce and one package with a plus error of 9/16 ounce. If the large plus error is included, the average error is zero. Actually the "pattern" is minus 1/16 ounce per package, and this is evident when the "unreasonably" large plus error is excluded from the average.)

EXAMPLE

Error in 1/16 oz	
−	0, +
3	0
1	2
⑥	0
	2
4	1
	0
	1
	6

(b) Calculate the average error by (1) subtracting the smaller sum (plus errors or minus errors) from the larger sum, (2) giving the result the sign (+ or −) of the larger sum (in the example above: +6−4=+2), and (3) dividing the result by the number of items not circled (or the total number of items, including the zeros, included in the sums). Thus, in the example, *average error* = +2/9.

This figure is the number of 16ths ounce that the "average" package of the sample (representing the lot being checked) deviates from zero error, and the sign indicates whether this

average error is plus (overweight) or minus (short weight). This "average" is, of course, exclusive of those packages having unreasonably large errors.

Under many circumstances the inspector will be in a position at this point to declare whether or not the lot under examination conforms to the requirements of the law. In certain instances when a very large lot—say 200 packages or more—is being checked, a further step is advisable. If the average error found in the sample of 10 representing the very large lot is plus, zero, or significantly minus, a decision on the lot is quite proper. If, however, the average error in the sample of 10 representing a very large lot is just barely minus, the inspector will want to convince himself that his small sample is truly representative. In this case 40 more packages should be selected *at random* from the *same* lot. These 40 packages should be weighed individually, the "unreasonably" large errors, plus and minus, circled and eliminated, and an average error calculated for the sample of 50 (the original 10 and the additional 40). Action should be taken on the lot according to the average error on the sample of 50, regardless of the magnitude of such average error.

Although the calculation designated (b) above is not necessary to establish the primary fact that the average net quantity of contents is or is not below the label quantity, this having been established at the conclusion of the computation designated (a), it is well for the inspector to complete the calculation of the average error in order that his report to his superior may be complete, in order that he may properly inform the packer as to the reason for any official action, and so that any record taken to court may be almost self-explanatory. (For action, if average quantity of contents is less than the declared quantity, see 10. Official Action.)

(It is advisable that all calculations made by the inspector be made on the official report form in order that these may be checked for accuracy later in the office.)

8.2. Standard-Pack Packages—Contents Sold by Weight.—The principal difference between the random and standard-pack packages from the standpoint of the checkweighing procedure is in the tare-weight determination. In random packages the tare material normally is readily available to the inspector, and for any random package being checked a duplicate of the packing material can be used on the checking scale to balance out the tare of the package. Obviously such is not the case in standard-pack packages. A procedure for checking standard-pack packages is given below:

Step 1. Weigh *gross* each of the 10 or more packages representing a sample of the same commodity and same type package to identify the *heaviest* and the *lightest* packages, gross weight, and record the gross weight of each.

Step 2. Open the lightest package, exercising care that none of the contents is spilled or lost, and determine the *net* weight of the contents. This can be done either by determining carefully the gross and tare weights and then subtracting the tare from the gross, or by weighing equally carefully the net contents. If the package being weighed is a "wet" commodity and if the label does not indicate the net weight is a "net drained weight," the fluid is part of the net weight and must be considered accordingly.

Step 3. If the net weight of the lightest package *at least equals* the declared net weight, it may be reasonable to assume that the lot is satisfactory.

Step 4. If the net weight of the lightest package *is less than* the declared weight, it will be necessary to treat the 10 packages as a sample of the lot and proceed to weigh them individually to determine individual errors. For this procedure it will be essential to arrive at an average tare weight to be used with the labeled net weight of the contents as the "standard" gross weight with which the package or packages are compared. In order to arrive at a representative average tare weight for the sample, the *heaviest* package must be opened, and the tare weight of this package and of the previously opened lightest package be determined to the nearest $\frac{1}{16}$ ounce. The average of these two tare weights may then be accepted as the tare weight for the weighing of the individual packages. (The inspector is cautioned that the tare of a single package is not considered acceptable as an average tare, and also that no "permanent" or "reference" record of tares is acceptably reliable. The same size can, bottle, or other container may vary significantly in weight over even a reasonably short factory run.)

Step 5. With standard weights in an amount equal to the average tare weight arrived at in Step 4 plus the labeled net weight on one side of the scale (or as the standard weight in the "substitution" procedure if an equal-arm scale is not used), weigh each package of the sample representing the lot and record the errors individually. Exclude, by circling, any errors (+ or −) that are unreasonably large, and determine an average error for the sample (see Steps 1, 2, 3, 4, and 5 of 8.1).

8.3. Standard-Pack Packages—Contents Sold by Liquid Measure.—The most convenient method of determining the accuracy of net-content labeling of packages containing liquids or semisolids and labeled by liquid measure is by weighing the packages. This method offers a rapid control procedure and should prove satisfactory for enforcement purposes, until the need for court action is indicated. *Any court action must be based on shortages of liquid quantity as determined by standard liquid measure* (*see Step 7 below*).

The control-by-weight method closely parallels the procedure described in 8.2. for standard-pack packages with contents sold by weight. For simplicity of presentation, a single commodity—fluid milk in 1-quart paper cartons—will be used as the example in the method description that follows:

Step 1. Open 2 cartons of milk and determine precisely (to the nearest $\frac{1}{32}$ ounce) the weight of one *measured* quart of the milk that is contained in the cartons under test, by first weighing an empty 1-quart standard measure and then weighing the measure filled with milk. The difference in the two weights will be the weight of one quart of the milk. This will serve as the *net* weight for the checkweighing procedure. If the first carton that is opened contains insufficient milk to fill the standard measure, use milk from the other carton for this purpose. (The correct net weight for the measured volume of milk must be determined for each dairy and for each type of fluid dairy product from a single dairy.)

Step 2. Weigh carefully (to the nearest $\frac{1}{32}$ ounce) the empty and dried cartons, from which the milk has been removed, to determine the *average* weight of the empty cartons. This average will serve as the *tare* for the checkweighing procedure. (It may be more convenient to go to each dairy plant that is distributing milk in paper cartons in the jurisdiction and weigh at least 10 cartons of each size and design, selected at random from the available stock. The averages thus obtained can serve as the tares for the checkweighing procedures throughout the jurisdiction. If this system of tare determination is followed, the averages should be checked frequently, because the weights of empty cartons, even from the same manufacturer, will vary somewhat over a period of time.)

Step 3. Select at random a sample of at least 10 cartons of milk of a single grade from a single dairy.

Step 4. Place on one pan of the equal-arm scale standard weights in the amount of the average tare plus the correct net weight of the cartons under test, and on the other pan, one at a time, the cartons of milk to be checked.

Step 5. As in Steps 2, 3, 4, and 5 of 8.1., determine the error in weight, to 1/16 ounce, of each carton of milk, list the zero errors and plus errors in one column and the minus errors in another column, exclude by circling any errors that are unreasonably large, and determine the average error for the sample. (The weight differences between the gross weights of the commercially filled cartons and the correct gross weights—the sum of the correct *net* weight of the measured quantity of milk and the average *tare* weight for the particular carton—represent the errors, over or under, in terms of weight.)

Step 6. If desired, these errors may be converted to liquid measure by determining mathematically the weight of 1 fluid ounce of milk and dividing the weight difference (error) by that figure. Thus, if 1 quart of a particular milk (32 fluid ounces) weighs 34.4 ounces avoirdupois, one fluid ounce weighs 34.4÷32, or 1.08 ounces avoirdupois. Then, if a carton is 1/2 (0.5) avoirdupois ounce short, it is 0.5÷1.08, or 0.46 fluid ounce short.

Step 7. If the checking of standard-pack packages labeled in terms of liquid measure is to result in prosecution, the actual complaint should be based on determinations of the quantity of contents of the packages by standard liquid measure. This is done by pouring the contents of each of the packages serving as the sample of the lot into a standard liquid measure and, using the small graduated glass standard, measuring carefully the liquid volume necessary to fill the standard or the liquid volume remaining in the carton after the standard has been filled. These shortages and overages are the errors that are to be considered in the determination of unreasonably short packages and of the average error.

9. CHECKING PRICE COMPUTATIONS

A necessary element of random-package checking (in addition to checkweighing) is the checking of selling-price computations. Obviously, even though the declared net weight on a package is accurate, there is involved a "shortage" if the total price shown on the label is greater than such declared weight multiplied by the price per pound.

It is suggested that not all random packages actually checkweighed need be checked for selling-price computations. The inspector should select from the samples that are checkweighed several different commodities, perhaps a high-priced item, a low-priced item, a large package, a small package, and the like, and check the selling-price computations on these. Of the sample of 10 of a single commodity that is

being checkweighed, it should be satisfactory to select 3 or 4 for price-computation checking. If errors are found in these, it will be advisable to check more.

Three methods of checking price computations are suggested.

9.1. Multiplication.—Price computations may be checked without any equipment except a pencil and paper by simply multiplying the declared weight by the price per pound. This process is complicated by the system of labeling in pounds, ounces, and binary submultiples of the ounce. For example, to check the price computation of a package labeled 1 pound 11½ ounces at 69¢ per pound, it is necessary to convert the weight to pounds only; thus 1 pound 11½ ounces = $1\frac{23}{32}$ pounds or $\frac{55}{32}$ or 1.7188 pounds. The correct computation then is 1.7188×0.69 or $1.19.

9.2. Prepackaging-Scale Computation Chart.—It is possible to use the computing chart of a prepackaging scale to check price computations. When this method is used, a very definite procedure must be followed. The weight indication on the scale must be made to read *exactly* the *labeled weight* of the package being checked. During this process the package is placed on the load-receiving element of the scale to bring the weight indication near to the labeled weight of the package, and then the tare-adjusting mechanism is used to bring the scale weight indication *precisely* to the labeled weight. Once the scale has been so loaded and so adjusted as to bring the weight indication precisely to the labeled weight of the package, the total selling-price computation may be read at the indicated price per pound. The inspector should not place on the scale the net contents of the package or standard weights in an amount equal to the labeled weight of the package and then expect the scale, without tare adjustment, to indicate the correct total selling price of the package. The actual weight of the package or its contents is not of concern in checking the accuracy of the price computation.

9.3. Price Computation Table.—Because the systems described in 9.1 and 9.2 are complicated either by involved mathematical calculations or by inconvenience of physical facility, a third method of checking price computations is offered. This method involves the use of the Price Computation Table presented as an appendix hereto. Through the use of this table, total selling prices may be arrived at either directly, or through very simple addition.

Down the left side of the table the horizontal rows are labeled in weights, from ¼ ounce to 5 pounds by quarter-

ounces and, across the top, the vertical columns are headed in prices per pound, from 1¢ (.01) to 9¢ (.09).

The use of the table is demonstrated in the four examples that follow:

EXAMPLE 1.—2 pounds 10 ounces at 8¢ per pound. (Illustrates procedure for prices per pound less than 10¢.)

Step 1. Locate in the left column the labeled weight—2 pounds 10 ounces.

Step 2. From this horizontal row of figures read directly the figure below the price per pound (.08)—.21000.

Step 3. Round off (see 9.3.1. below) to .21 or 21¢. This is the correct total selling price.

EXAMPLE 2.—1 pound 11½ ounces at 69¢ per pound. (Illustrates procedure for prices per pound of 10¢ (.10) to 99¢ (.99), inclusive.)

Step 1. Locate in the left column the labeled weight—1 pound 11½ ounces.

Step 2. Jot down from this horizontal row of figures the figure below the last digit (9) of the price per pound. This figure is the selling price for 1 pound 11½ ounces at 9¢ per pound (.15469).

Step 3. As 60¢+9¢=69¢, the sum of the figures shown for a given weight at .06 (6¢), when multiplied by 10, plus the figure shown for the same weight at .09 (9¢) is the total selling price for that weight at 69¢ per pound. Thus the figure shown in the row for 1 pound 11½ ounces at .06 per pound (.10312) is multiplied by 10 by moving the decimal point one place to the right and arriving at 1.0312—the selling price for the weight at 60¢ per pound. This is then added to the figure obtained in Step 2:

$ .15469
1.0312

$1.18589

Step 4. This sum is rounded off (see 9.3.1. below) to a $1.19, which is the correct selling price for 1 pound 11½ ounces at 69¢ per pound.

EXAMPLE 3.—12¾ ounces at $1.29 per pound. (Illustrates procedure for prices per pound of $1.00 to $9.99, inclusive.)

Steps 1, 2, and 3. The same operations as Steps 1, 2, and 3, Example 2, resulting in .07172 as a selling price at 9¢ per pound and 0.1594 as the selling price at 20¢ per pound.

Step 4. As $1.00+20¢+9¢=$1.29, the indicated price for the stated weight at 1¢ (.01) is multiplied by 100 by moving the decimal point 2 places to the right and arriving at 00.797, the selling price for the weight at $1.00 per pound. This figure is added to the figures obtained in the step above:

$ .07172
0.1594
0.797

$1.02812

Step 5. This figure is rounded off (see 9.3.1 below) to a $1.03, which is the correct total selling price for 12¾ ounces at $1.29 per pound.

EXAMPLE 4.—8 pounds 2 ounces at 89¢ per pound. (Illustrates procedure for packages with labeled weights greater than 5 pounds—the upper limit of the table.)

Step 1. Arrive at the selling price for 2 ounces at 9¢ and at 80¢ as per Example 2, thus

$ .01125
0.1000

Step 2. To these add the product of the price per pound times the number of pounds—$0.89×8=$7.12

$ .01125
0.1000
7.12

$7.23125

Step 3. This is rounded off (see 10.3.1 below) to $7.23, which is the correct total selling price for 8 pounds 2 ounces at 89¢ per pound.

SUMMARY.—As can be seen by the foregoing examples, the table is developed and is used on the very simple decimal system; thus it is possible to have a single series of digits up to 9¢ (.09) per pound, and this series is made to be the equivalent to 90¢ per pound by moving the decimal 1 place to the right and the equivalent of $9.00 per pound by moving the decimal point 2 places to the right. Using 12 ounces as an example, it is seen that

12 ounces at 9¢ per pound =$0. 06750
12 ounces at 90¢ per pound = 0. 6750
12 ounces at $9.00 per pound= 6. 750

In this system any zero digits in the price per pound are ignored. The selling price at 80¢ per pound is reached by moving the decimal at 8¢ (.08) one place to the right and then rounding off. At a $1.09 per pound, the price for the last digit (9) is taken from the table and the price for $1.00 arrived at by moving the .01 figure two places to the right; these two figures then are added for the total selling price.

9.3.1. Rounding Off.—The figures arrived at through the use of the Price Computation Table must be rounded off to dollars and cents. The following rule is offered as being consistent with commercial practice and reasonable. If the figures to the right of the "cents" represent exactly ½ cent or *more* than ½ cent, round off to the next greater cent. If these figures represent less than ½ cent, round off by dropping them. Thus any figure from .00500 to .00999 would be rounded *up* to .01, and any figure from .00001 to .00499 would be rounded *down* to .00.

10. OFFICIAL ACTION RESULTING FROM PACKAGE CHECKING

10.1. Oral Discussions and Instructions.—Following the completion of the package-checking operations in a particular business establishment, an oral discussion of the results, between the inspector and the person in charge of the establishment, is recommended. Results of the checking should be explained by the inspector, and the information on the report form described. If the samples checked indicate general compliance with the law and regulations, yet there are found inconsistencies in weighing patterns, precision or accuracy less than the inspector is encountering in similar packages by other packers, or any other practices that should receive attention, these should be explained in detail. Many times the inspector will find that his experience will make possible helpful suggestions for the store operator regarding ways and means of increasing accuracy of package labeling.

Oral discussion may also take the form of a "warning" that certain relatively serious conditions that have been found must be corrected.

Any recommendations, instructions, or warnings that are issued orally should be shown in abbreviated form on the official report, as, for example, "oral instructions re: large

overages on packages," "oral instructions re: unnecessary + and — errors," or "warned re: pricing errors." The inference to be drawn from a warning (as distinguished from a recommendation or instruction) is that a continuation of the condition warned against will bring about punitive action by the official.

10.2. Legal Action.—In case the checking procedure discloses (a) one or more packages with unreasonably large minus errors, (b) an average minus error for the entire lot of packages, or (c) significant errors in selling price computations of one or more packages, there will have been demonstrated violation of legal requirements, and the need for punitive action may be indicated.

Legal action may take one or more of several forms, as the law in the particular jurisdiction provides, as per instructions from a superior, and as good judgment dictates: (1) "stop-sale" or "off-sale" orders, which normally provide that the lot cannot be offered for sale until officially released; (2) "reweighing" or "remarking" orders, which provide that an entire lot or individual items from a lot cannot be offered for sale until they have been corrected as to content or labeling (obviously applicable only to random packages, since standard-pack packages no longer would be standard-pack if each were to be remarked with a corrected quantity of contents); or (3) prosecution, in which case it is advisable to purchase or confiscate samples as evidence of the violation.

Whenever legal action is decided upon, this should be described in full on the official report form.

11. REPORT FORM

A suggested Package Checking Report form is shown as figure 1. This form should be printed on letter-size stock in order to provide ample space for the necessary entries and convenience in filing in standard-size facilities.

Under the system proposed, one form would be used for each lot of packages checked, and on the form would be entered relatively complete data concerning that lot.

Each report form should be filled in carefully and should be signed by the inspector. The signature of the business representative to whom any instructions, recommendations, or official information are given should be obtained in the indicated space at the lower right-hand corner of the form and a copy should be left with him. In the case of "chain store" operations, it is suggested that a copy of the report be furnished an immediate superior of the store manager or to another person designated by the company.

Figure 2 illustrates a sample report form filled out for random packages, and figure 3 shows a form covering standard-pack packages.

DEPARTMENT HEADING

PACKAGE CHECKING REPORT

Date _____

Name _____ Business _____

Address _____

QUANTITY STATEMENT				SELLING PRICE STATEMENT			
Item	Labeled Quantity	Error in —	Error in 0, +	Labeled	Computed	Label Error	Commodity
1							Brand
2							Packer or Distributor
3							
4							Address of Packer or Distributor
5							
6							Price per Unit
7							
8							$ _____ per _____
9							Approx. Number in Lot
10							
11							Tare Wt. - - Standard Pack
12							Lightest _____
13							Heaviest _____
14							Average _____
15							Equipment Used in Checking
TOTALS							

Calculations: _____ (Total weighing error (+ and — considered)) ÷ _____ (No. of Pkgs.) = _____ Average error in _____

Remarks and/or Instructions: _____

_____

_____ Inspector

Receipt of Report Acknowledged:

_____ Business Owner or Operator

FIGURE 1

DEPARTMENT HEADING

PACKAGE CHECKING REPORT

Date 8/3

Name J. Remo, Inc. Business Retail Grocery

Address 4725 H Street

Item	QUANTITY STATEMENT Labeled Quantity	Error in 1/16 oz —	Error in 1/16 oz 0, +	SELLING PRICE STATEMENT Labeled	Computed	Label Error
1	1lb-2oz	(7)		$.55		
2	1 -2½	1		.57	.57	None
3	-13		0	.40		
4	2 -1	1		1.01		
5	1 -10¼		2	.80	.80	None
6	1 - 3		3	.58		
7	1 -11¾		1	.85		
8	-10		0	.31	.31	None
9	-14½	1		.44		
10	1 -12		2	.86		
11						
12						
13						
14						
15						
	TOTALS	3	8			

Commodity: Hamburger

Brand: Own

Packer or Distributor: Self

Address of Packer or Distributor: Same

Price per Unit: $.49 per pound

Approx. Number in Lot: 80

Tare Wt. - - Standard Pack
Lightest
Heaviest
Average

Equipment Used in Checking: 3-lb-Equal Arm

Calculations: +5 (Total weighing error (+ and — considered)) ÷ 9 (No. of Pkgs.) = +5/9 (Average error in 1/16 oz)

+5/9 ÷ 16 = .+0.03 oz. Average weighing Error

9 | 5.000 — .555 — 45 — 50 — 45 — 50

16 | 555 — .034 — 48 — 75 — 64

.10406
0.4625
0.56656

.14766
0.6562
0.80386

.05625
0.2500
0.30625

Remarks and/or Instructions:

Item 1 ordered remarked

J. Robinson
Inspector

Receipt of Report Acknowledged:
H.N. Store
Business Owner or Operator

FIGURE 2

DEPARTMENT HEADING

PACKAGE CHECKING REPORT

Date 8/3

Name J. Remo, Inc. Business Retail Grocery

Address 4725 H Street

QUANTITY STATEMENT				SELLING PRICE STATEMENT			
Item	Labeled Quantity	Error in 1/16 oz. —	Error in 1/16 oz. 0, +	Labeled	Computed	Label Error	
1	1 pound		1				
2	"		0				
3	"	3					
4	"		0				
5	"	5					
6	"	4					
7	"		1				
8	"	2					
9	"		0				
10	"	2					
11							
12							
13							
14							
15							
	TOTALS	16	2				

Commodity: Sugar

Brand: Midnight

Packer or Distributor: Midnight Refiners

Address of Packer or Distributor: 1701 R Street

Price per Unit: $ _____ per _____

Approx. Number in Lot: 170

Tare Wt. - - Standard Pack
Lightest 1 oz.
Heaviest 1 1/2 oz.
Average 1 1/4 oz.

Equipment Used in Checking: 3 lb. - Equal Arm

Calculations: $\frac{-14}{\text{Total weighing error (+ and — considered)}} \div \frac{10}{\text{No. of Pkgs.}} = \frac{-1.4}{\text{Average error in } 1/16 \text{ oz.}}$

$-1.4 \div 16 = -0.09$ oz. Average weighing error

$10 \overline{)14.0}$ (1.4) $\quad 16 \overline{)1.4000}$ (.0875)
10
40
40
128
120
112
80
80

Remarks and/or Instructions: "Entire lot ordered off sale"

J. Robinson
Inspector

Receipt of Report Acknowledged:
H. N. Store
Business Owner or Operator

FIGURE 3

APPENDIX

PRICE COMPUTATION TABLE

Lbs.	Ounces	PRICE PER POUND .01	.02	.03	.04	.05	.06	.07	.08	.09
	¼	.00016	.00031	.00047	.00062	.00078	.00094	.00109	.00125	.00141
	½	.00031	.00062	.00094	.00125	.00156	.00188	.00219	.00250	.00281
	¾	.00047	.00094	.00141	.00188	.00234	.00281	.00328	.00375	.00422
	1	.00062	.00125	.00188	.00250	.00312	.00375	.00438	.00500	.00562
	1¼	.00078	.00156	.00234	.00312	.00391	.00469	.00547	.00625	.00703
	1½	.00094	.00188	.00281	.00375	.00469	.00562	.00656	.00750	.00844
	1¾	.00109	.00219	.00328	.00438	.00547	.00656	.00766	.00875	.00984
	2	.00125	.00250	.00375	.00500	.00625	.00750	.00875	.01000	.01125
	2¼	.00141	.00281	.00422	.00562	.00703	.00844	.00984	.01125	.01266
	2½	.00156	.00312	.00469	.00625	.00781	.00938	.01094	.01250	.01406
	2¾	.00172	.00344	.00516	.00688	.00859	.01031	.01203	.01375	.01547
	3	.00188	.00375	.00562	.00750	.00938	.01125	.01312	.01500	.01688
	3¼	.00203	.00406	.00609	.00812	.01016	.01219	.01422	.01625	.01828
	3½	.00219	.00438	.00656	.00875	.01094	.01312	.01531	.01750	.01969
	3¾	.00234	.00469	.00703	.00938	.01172	.01406	.01641	.01875	.02109
	4	.00250	.00500	.00750	.01000	.01250	.01500	.01750	.02000	.02250
	4¼	.00266	.00531	.00797	.01062	.01328	.01594	.01859	.02125	.02391
	4½	.00281	.00562	.00844	.01125	.01406	.01688	.01969	.02250	.02531
	4¾	.00297	.00594	.00891	.01188	.01484	.01781	.02078	.02375	.02672
	5	.00312	.00625	.00938	.01250	.01562	.01875	.02188	.02500	.02812
	5¼	.00328	.00656	.00984	.01312	.01641	.01969	.02297	.02625	.02953
	5½	.00344	.00688	.01031	.01375	.01719	.02062	.02406	.02750	.03094
	5¾	.00359	.00719	.01078	.01438	.01797	.02156	.02516	.02875	.03234
	6	.00375	.00750	.01125	.01500	.01875	.02250	.02625	.03000	.03375
	6¼	.00391	.00781	.01172	.01562	.01953	.02344	.02734	.03125	.03516
	6½	.00406	.00812	.01219	.01625	.02031	.02438	.02844	.03250	.03656
	6¾	.00422	.00844	.01266	.01688	.02109	.02531	.02953	.03375	.03797
	7	.00438	.00875	.01312	.01750	.02188	.02625	.03062	.03500	.03938
	7¼	.00453	.00906	.01359	.01812	.02266	.02719	.03172	.03625	.04078
	7½	.00469	.00938	.01406	.01875	.02344	.02812	.03281	.03750	.04219
	7¾	.00484	.00969	.01453	.01938	.02422	.02906	.03391	.03875	.04359
	8	.00500	.01000	.01500	.02000	.02500	.03000	.03500	.04000	.04500
	8¼	.00516	.01031	.01547	.02062	.02578	.03094	.03609	.04125	.04641
	8½	.00531	.01062	.01594	.02125	.02656	.03188	.03719	.04250	.04781
	8¾	.00547	.01094	.01641	.02188	.02734	.03281	.03828	.04375	.04922
	9	.00562	.01125	.01688	.02250	.02812	.03375	.03938	.04500	.05062
	9¼	.00578	.01156	.01734	.02312	.02891	.03469	.04047	.04625	.05203
	9½	.00594	.01188	.01781	.02375	.02969	.03562	.04156	.04750	.05344
	9¾	.00609	.01219	.01828	.02438	.03047	.03656	.04266	.04875	.05484
	10	.00625	.01250	.01875	.02500	.03125	.03750	.04375	.05000	.05625
	10¼	.00641	.01281	.01922	.02562	.03203	.03844	.04484	.05125	.05766
	10½	.00656	.01312	.01969	.02625	.03281	.03938	.04594	.05250	.05906
	10¾	.00672	.01344	.02016	.02688	.03359	.04031	.04703	.05375	.06047
	11	.00688	.01375	.02062	.02750	.03438	.04125	.04812	.05500	.06188
	11¼	.00703	.01406	.02109	.02812	.03516	.04219	.04922	.05625	.06328
	11½	.00719	.01438	.02156	.02875	.03594	.04312	.05031	.05750	.06469
	11¾	.00734	.01469	.02203	.02938	.03672	.04406	.05141	.05875	.06609
	12	.00750	.01500	.02250	.03000	.03750	.04500	.05250	.06000	.06750
	12¼	.00766	.01531	.02297	.03062	.03828	.04594	.05359	.06125	.06891
	12½	.00781	.01562	.02344	.03125	.03906	.04688	.05469	.06250	.07031
	12¾	.00797	.01594	.02391	.03188	.03984	.04781	.05578	.06375	.07172

		PRICE PER POUND								
Lbs.	Ounces	.01	.02	.03	.04	.05	.06	.07	.08	.09
	13	.00812	.01625	.02438	.03250	.04062	.04875	.05688	.06500	.07312
	13¼	.00828	.01656	.02484	.03312	.04141	.04969	.05797	.06625	.07453
	13½	.00844	.01688	.02531	.03375	.04219	.05062	.05906	.06750	.07594
	13¾	.00859	.01719	.02578	.03438	.04297	.05156	.06016	.06875	.07734
	14	.00875	.01750	.02625	.03500	.04375	.05250	.06125	.07000	.07875
	14¼	.00891	.01781	.02672	.03562	.04453	.05344	.06234	.07125	.08016
	14½	.00906	.01812	.02719	.03625	.04531	.05438	.06344	.07250	.08156
	14¾	.00922	.01844	.02766	.03688	.04609	.05531	.06453	.07375	.08297
	15	.00938	.01875	.02812	.03750	.04688	.05625	.06562	.07500	.08438
	15¼	.00953	.01906	.02859	.03812	.04766	.05719	.06672	.07625	.08578
	15½	.00969	.01938	.02906	.03875	.04844	.05812	.06781	.07750	.08719
	15¾	.00984	.01969	.02953	.03938	.04922	.05906	.06891	.07875	.08859
1	--------	.01000	.02000	.03000	.04000	.05000	.06000	.07000	.08000	.09000
1	¼	.01016	.02031	.03047	.04062	.05078	.06094	.07109	.08125	.09141
1	½	.01031	.02062	.03094	.04125	.05156	.06188	.07219	.08250	.09281
1	¾	.01047	.02094	.03141	.04188	.05234	.06281	.07328	.08375	.09422
1	1	.01062	.02125	.03188	.04250	.05312	.06375	.07438	.08500	.09562
1	1¼	.01078	.02156	.03234	.04312	.05391	.06469	.07547	.08625	.09703
1	1½	.01094	.02188	.03281	.04375	.05469	.06562	.07656	.08750	.09844
1	1¾	.01109	.02219	.03328	.04438	.05547	.06656	.07766	.08875	.09984
1	2	.01125	.02250	.03375	.04500	.05625	.06750	.07875	.09000	.10125
1	2¼	.01141	.02281	.03422	.04562	.05703	.06844	.07984	.09125	.10266
1	2½	.01156	.02312	.03469	.04625	.05781	.06938	.08094	.09250	.10406
1	2¾	.01172	.02344	.03516	.04688	.05859	.07031	.08203	.09375	.10547
1	3	.01188	.02375	.03562	.04750	.05938	.07125	.08312	.09500	.10688
1	3¼	.01203	.02406	.03609	.04812	.06016	.07219	.08422	.09625	.10828
1	3½	.01219	.02438	.03656	.04875	.06094	.07312	.08531	.09750	.10969
1	3¾	.01234	.02469	.03703	.04938	.06172	.07406	.08641	.09875	.11109
1	4	.01250	.02500	.03750	.05000	.06250	.07500	.08750	.10000	.11250
1	4¼	.01266	.02531	.03797	.05062	.06328	.07594	.08859	.10125	.11391
1	4½	.01281	.02562	.03844	.05125	.06406	.07688	.08969	.10250	.11531
1	4¾	.01297	.02594	.03891	.05188	.06484	.07781	.09078	.10375	.11672
1	5	.01312	.02625	.03938	.05250	.06562	.07875	.09188	.10500	.11812
1	5¼	.01328	.02656	.03984	.05312	.06641	.07969	.09297	.10625	.11953
1	5½	.01344	.02688	.04031	.05375	.06719	.08062	.09406	.10750	.12094
1	5¾	.01359	.02719	.04078	.05438	.06797	.08156	.09516	.10875	.12234
1	6	.01375	.02750	.04125	.05500	.06875	.08250	.09625	.11000	.12375
1	6¼	.01391	.02781	.04172	.05562	.06953	.08344	.09734	.11125	.12516
1	6½	.01406	.02812	.04219	.05625	.07031	.08438	.09844	.11250	.12656
1	6¾	.01422	.02844	.04266	.05688	.07109	.08531	.09953	.11375	.12797
1	7	.01438	.02875	.04312	.05750	.07188	.08625	.10062	.11500	.12938
1	7¼	.01453	.02906	.04359	.05812	.07266	.08719	.10172	.11625	.13078
1	7½	.01469	.02938	.04406	.05875	.07344	.08812	.10281	.11750	.13219
1	7¾	.01484	.02969	.04453	.05938	.07422	.08906	.10391	.11875	.13359
1	8	.01500	.03000	.04500	.06000	.07500	.09000	.10500	.12000	.13500
1	8¼	.01516	.03031	.04547	.06062	.07578	.09094	.10609	.12125	.13641
1	8½	.01531	.03062	.04594	.06125	.07656	.09188	.10719	.12250	.13781
1	8¾	.01547	.03094	.04641	.06188	.07734	.09281	.10828	.12375	.13922
1	9	.01562	.03125	.04688	.06250	.07812	.09375	.10938	.12500	.14062
1	9¼	.01578	.03156	.04734	.06312	.07891	.09469	.11047	.12625	.14203
1	9½	.01594	.03188	.04781	.06375	.07969	.09562	.11156	.12750	.14344
1	9¾	.01609	.03219	.04828	.06438	.08047	.09656	.11266	.12875	.14484
1	10	.01625	.03250	.04875	.06500	.08125	.09750	.11375	.13000	.14625
1	10¼	.01641	.03281	.04922	.06562	.08203	.09844	.11484	.13125	.14766
1	10½	.01656	.03312	.04969	.06625	.08281	.09938	.11594	.13250	.14906
1	10¾	.01672	.03344	.05016	.06688	.08359	.10031	.11703	.13375	.15047

Lbs.	Ounces	PRICE PER POUND								
		.01	.02	.03	.04	.05	.06	.07	.08	.09
1	11	.01688	.03375	.05062	.06750	.08438	.10125	.11812	.13500	.15188
1	11¼	.01703	.03406	.05109	.06812	.08516	.10219	.11922	.13625	.15328
1	11½	.01719	.03438	.05156	.06875	.08594	.10312	.12031	.13750	.15469
1	11¾	.01734	.03469	.05203	.06938	.08672	.10406	.12141	.13875	.15609
1	12	.01750	.03500	.05250	.07000	.08750	.10500	.12250	.14000	.15750
1	12¼	.01766	.03531	.05297	.07062	.08828	.10594	.12359	.14125	.15891
1	12½	.01781	.03562	.05344	.07125	.08906	.10688	.12469	.14250	.16031
1	12¾	.01797	.03594	.05391	.07188	.08984	.10781	.12578	.14375	.16172
1	13	.01812	.03625	.05438	.07250	.09062	.10875	.12688	.14500	.16312
1	13¼	.01828	.03656	.05484	.07312	.09141	.10969	.12797	.14625	.16453
1	13½	.01844	.03688	.05531	.07375	.09219	.11062	.12906	.14750	.16594
1	13¾	.01859	.03719	.05578	.07438	.09297	.11156	.13016	.14875	.16734
1	14	.01875	.03750	.05625	.07500	.09375	.11250	.13125	.15000	.16875
1	14¼	.01891	.03781	.05672	.07562	.09453	.11344	.13234	.15125	.17016
1	14½	.01906	.03812	.05719	.07625	.09531	.11438	.13344	.15250	.17156
1	14¾	.01922	.03844	.05766	.07688	.09609	.11531	.13453	.15375	.17297
1	15	.01938	.03875	.05812	.07750	.09688	.11625	.13562	.15500	.17438
1	15¼	.01953	.03906	.05859	.07812	.09766	.11719	.13672	.15625	.17578
1	15½	.01969	.03938	.05906	.07875	.09844	.11812	.13781	.15750	.17719
1	15¾	.01984	.03969	.05953	.07938	.09922	.11906	.13891	.15875	.17859
2	--------	.02000	.04000	.06000	.08000	.10000	.12000	.14000	.16000	.18000
2	¼	.02016	.04031	.06047	.08062	.10078	.12094	.14109	.16125	.18141
2	½	.02031	.04062	.06094	.08125	.10156	.12188	.14219	.16250	.18281
2	¾	.02047	.04094	.06141	.08188	.10234	.12281	.14328	.16375	.18422
2	1	.02062	.04125	.06188	.08250	.10312	.12375	.14438	.16500	.18562
2	1¼	.02078	.04156	.06234	.08312	.10391	.12469	.14547	.16625	.18703
2	1½	.02094	.04188	.06281	.08375	.10469	.12562	.14656	.16750	.18844
2	1¾	.02109	.04219	.06328	.08438	.10547	.12656	.14766	.16875	.18984
2	2	.02125	.04250	.06375	.08500	.10625	.12750	.14875	.17000	.19125
2	2¼	.02141	.04281	.06422	.08562	.10703	.12844	.14984	.17125	.19266
2	2½	.02156	.04312	.06469	.08625	.10781	.12938	.15094	.17250	.19406
2	2¾	.02172	.04344	.06516	.08688	.10859	.13031	.15203	.17375	.19547
2	3	.02188	.04375	.06562	.08750	.10938	.13125	.15312	.17500	.19688
2	3¼	.02203	.04406	.06609	.08812	.11016	.13219	.15422	.17625	.19828
2	3½	.02219	.04438	.06656	.08875	.11094	.13312	.15531	.17750	.19969
2	3¾	.02234	.04469	.06703	.08938	.11172	.13406	.15641	.17875	.20109
2	4	.02250	.04500	.06750	.09000	.11250	.13500	.15750	.18000	.20250
2	4¼	.02266	.04531	.06797	.09062	.11328	.13594	.15859	.18125	.20391
2	4½	.02281	.04562	.06844	.09125	.11406	.13688	.15969	.18250	.20531
2	4¾	.02297	.04594	.06891	.09188	.11484	.13781	.16078	.18375	.20672
2	5	.02312	.04625	.06938	.09250	.11562	.13875	.16188	.18500	.20812
2	5¼	.02328	.04656	.06984	.09312	.11641	.13969	.16297	.18625	.20953
2	5½	.02344	.04688	.07031	.09375	.11719	.14062	.16406	.18750	.21094
2	5¾	.02359	.04719	.07078	.09438	.11797	.14156	.16516	.18875	.21234
2	6	.02375	.04750	.07125	.09500	.11875	.14250	.16625	.19000	.21375
2	6¼	.02391	.04781	.07172	.09562	.11953	.14344	.16734	.19125	.21516
2	6½	.02406	.04812	.07219	.09625	.12031	.14438	.16844	.19250	.21656
2	6¾	.02422	.04844	.07266	.09688	.12109	.14531	.16953	.19375	.21797
2	7	.02438	.04875	.07312	.09750	.12188	.14625	.17062	.19500	.21938
2	7¼	.02453	.04906	.07359	.09812	.12266	.14719	.17172	.19625	.22078
2	7½	.02469	.04938	.07406	.09875	.12344	.14812	.17281	.19750	.22219
2	7¾	.02484	.04969	.07453	.09938	.12422	.14906	.17391	.19875	.22359
2	8	.02500	.05000	.07500	.10000	.12500	.15000	.17500	.20000	.22500
2	8¼	.02516	.05031	.07547	.10062	.12578	.15094	.17609	.20125	.22641
2	8½	.02531	.05062	.07594	.10125	.12656	.15188	.17719	.20250	.22781
2	8¾	.02547	.05094	.07641	.10188	.12734	.15281	.17828	.20375	.22922

Lbs.	Ounces	PRICE PER POUND .01	.02	.03	.04	.05	.06	.07	.08	.09
2	9	.02562	.05125	.07688	.10250	.12812	.15375	.17938	.20500	.23062
2	9¼	.02578	.05156	.07734	.10312	.12891	.15469	.18047	.20625	.23203
2	9½	.02594	.05188	.07781	.10375	.12969	.15562	.18156	.20750	.23344
2	9¾	02609	.05219	.07828	.10438	.13047	.15656	.18266	.20875	.23484
2	10	.02625	.05250	.07875	.10500	.13125	.15750	.18375	.21000	.23625
2	10¼	.02641	.05281	.07922	.10562	.13203	.15844	.18484	.21125	.23766
2	10½	.02656	.05312	.07969	.10625	.13281	.15938	.18594	.21250	.23906
2	10¾	.02672	.05344	.08016	.10688	.13359	.16031	.18703	.21375	.24047
2	11	.02688	.05375	.08062	.10750	.13438	.16125	.18812	.21500	.24188
2	11¼	.02703	.05406	.08109	.10812	.13516	.16219	.18922	.21625	.24328
2	11½	.02719	.05438	.08156	.10875	.13594	.16312	.19031	.21750	.24469
2	11¾	.02734	.05469	.08203	.10938	.13672	.16406	.19141	.21875	.24609
2	12	.02750	.05500	.08250	.11000	.13750	.16500	.19250	.22000	.24750
2	12¼	.02766	.05531	.08297	.11062	.13828	.16594	.19359	.22125	.24891
2	12½	.02781	.05562	.08344	.11125	.13906	.16688	.19469	.22250	.25031
2	12¾	.02797	.05594	.08391	.11188	.13984	.16781	.19578	.22375	.25172
2	13	.02812	.05625	.08438	.11250	.14062	.16875	.19688	.22500	.25312
2	13¼	.02828	.05656	.08484	.11312	.14141	.16969	.19797	.22625	.25453
2	13½	.02844	.05688	.08531	.11375	.14219	.17062	.19906	.22750	.25594
2	13¾	.02859	.05719	.08578	.11438	.14297	.17156	.20016	.22875	.25734
2	14	.02875	.05750	.08625	.11500	.14375	.17250	.20125	.23000	.25875
2	14¼	.02891	.05781	.08672	.11562	.14453	.17344	.20234	.23125	.26016
2	14½	.02906	.05812	.08719	.11625	.14531	.17438	.20344	.23250	.26156
2	14¾	.02922	.05844	.08766	.11688	.14609	.17531	.20453	.23375	.26297
2	15	.02938	.05875	.08812	.11750	.14688	.17625	.20562	.23500	26438
2	15¼	.02953	.05906	.08859	.11812	.14766	.17719	.20672	.23625	.26578
2	15½	.02969	.05938	.08906	.11875	.14844	.17812	.20781	.23750	.26719
2	15¾	.02984	.05969	.08953	.11938	.14922	.17906	.20891	.23875	.26859
3	--------	.03000	.06000	.09000	.12000	.15000	.18000	.21000	.24000	.27000
3	¼	.03016	.06031	.09047	.12062	.15078	.18094	.21109	.24125	.27141
3	½	.03031	.06062	.09094	.12125	.15156	.18188	.21219	.24250	.27281
3	¾	.03047	.06094	.09141	.12188	.15234	.18281	.21328	.24375	.27422
3	1	.03062	.06125	.09188	.12250	.15312	.18375	.21438	.24500	.27562
3	1¼	.03078	.06156	.09234	.12312	.15391	.18469	.21547	.24625	.27703
3	1½	.03094	.06188	.09281	.12375	.15469	.18562	.21656	.24750	.27844
3	1¾	.03109	.06219	.09328	.12438	.15547	.18656	.21766	.24875	.27984
3	2	.03125	.06250	.09375	.12500	.15625	.18750	.21875	.25000	.28125
3	2¼	.03141	.06281	.09422	.12562	.15703	.18844	.21984	.25125	.28266
3	2½	.03156	.06312	.09469	.12625	.15781	.18938	.22094	.25250	.28406
3	2¾	.03172	.06344	.09516	.12688	.15859	.19031	.22203	.25375	.28547
3	3	.03188	.06375	.09562	.12750	.15938	.19125	.22312	.25500	.28688
3	3¼	.03203	.06406	.09609	.12812	.16016	.19219	.22422	.25625	.28828
3	3½	.03219	.06438	.09656	.12875	.16094	.19312	.22531	.25750	.28969
3	3¾	.03234	.06469	.09703	.12938	.16172	.19406	.22641	.25875	.29109
3	4	.03250	.06500	.09750	.13000	.16250	.19500	.22750	.26000	.29250
3	4¼	.03266	.06531	.09797	.13062	.16328	.19594	.22859	.26125	.29391
3	4½	.03281	.06562	.09844	.13125	.16406	.19688	.22969	.26250	29531
3	4¾	.03297	.06594	.09891	.13188	.16484	.19871	.23078	.26375	.29672
3	5	.03312	.06625	.09938	.13250	.16562	.19875	.23188	.26500	.29812
3	5¼	.03328	.06656	.09984	.13312	.16641	.19969	.23297	.26625	.29953
3	5½	.03344	.06688	.10031	.13375	.16719	.20062	.23406	.26750	.30094
3	5¾	.03359	.06719	.10078	.13438	.16797	.20156	.23516	.26875	.30234
3	6	.03375	.06750	.10125	.13500	.16875	.20250	.23625	.27000	.30375
3	6¼	.03391	.06781	.10172	.13562	.16953	.20344	.23734	.27125	.30516
3	6½	.03406	.06812	.10219	.13625	.17031	.20438	.23844	.27250	.30656
3	6¾	.03422	.06844	.10266	.13688	.17109	.20531	.23953	.27375	.30797

Lbs.	Ounces	PRICE PER POUND								
		.01	.02	.03	.04	.05	.06	.07	.08	.09
3	7	.03438	.06875	.10312	.13750	.17188	.20625	.24062	.27500	.30938
3	7¼	.03453	.06906	.10359	.13812	.17266	.20719	.24172	.27625	.31078
3	7½	.03469	.06938	.10406	.13875	.17344	.20812	.24281	.27750	.31219
3	7¾	.03484	.06969	.10453	.13938	.17422	.20906	.24391	.27875	.31359
3	8	.03500	.07000	.10500	.14000	.17500	.21000	.24500	.28000	.31500
3	8¼	.03516	.07031	.10547	.14062	.17578	.21094	.24609	.28125	.31641
3	8½	.03531	.07062	.10594	.14125	.17656	.21188	.24719	.28250	.31781
3	8¾	.03547	.07094	.10641	.14188	.17734	.21281	.24828	.28375	.31922
3	9	.03562	.07125	.10688	.14250	.17812	.21375	.24938	.28500	.32062
3	9¼	.03578	.07156	.10734	.14312	.17891	.21469	.25047	.28625	.32203
3	9½	.03594	.01788	.10781	.14375	.17969	.21562	.25156	.28750	.32344
3	9¾	.03609	.07219	.10828	.14438	.18047	.21656	.25266	.28875	.32484
3	10	.03625	.07250	.10875	.14500	.18125	.21750	.25375	.29000	.32625
3	10¼	.03641	.07281	.10922	.14562	.18203	.21844	.25484	.29125	.32766
3	10½	.03656	.07312	.10969	.14625	.18281	.21938	.25594	.29250	.32906
3	10¾	.03672	.07344	.11016	.14688	.18359	.22031	.25703	.29375	.33047
3	11	.03688	.07375	.11062	.14750	.18438	.22125	.25812	.29500	.33188
3	11¼	.03703	.07406	.11109	.14812	.18516	.22219	.25922	.29625	.33328
3	11½	.03719	.07438	.11156	.14875	.18594	.22312	.26031	.29750	.33469
3	11¾	.03734	.07469	.11203	.14938	.18672	.22406	.26141	.29875	.33609
3	12	.03750	.07500	.11250	.15000	.18750	.22500	.26250	.30000	.33750
3	12¼	.03766	.07531	.11297	.15062	.18828	.22594	.26359	.30125	.33891
3	12½	.03781	.07562	.11344	.15125	.18906	.22688	.26469	.30250	.34031
3	12¾	.03797	.07594	.11391	.15188	.18984	.22781	.26578	.30375	.34172
3	13	.03812	.07625	.11438	.15250	.19062	.22875	.26688	.30500	.34312
3	13¼	.03828	.07656	.11484	.15312	.19141	.22969	.26797	.30625	.34453
3	13½	.03844	.07688	.11531	.15375	.19219	.23062	.26906	.30750	.34594
3	13¾	.03859	.07719	.11578	.15438	.19297	.23156	.27016	.30875	.34734
3	14	.03875	.07750	.11625	.15500	.19375	.23250	.27125	.31000	.34875
3	14¼	.03891	.07781	.11672	.15562	.19453	.23344	.27234	.31125	.35016
3	14½	.03906	.07812	.11719	.15625	.19531	.23438	.27344	.31250	.35156
3	14¾	.03922	.07844	.11766	.15688	.19609	.23531	.27453	.31375	.35297
3	15	.03938	.07875	.11812	.15750	.19688	.23625	.27562	.31500	.35438
3	15¼	.03953	.07906	.11859	.15812	.19766	.23719	.27672	.31625	.35578
3	15½	.03969	.07938	.11906	.15875	.19844	.23812	.27781	.31750	.35719
3	15¾	.03984	.07969	.11953	.15938	.19922	.23906	.27891	.31875	.35859
4	--------	.04000	.08000	.12000	.16000	.20000	.24000	.28000	.32000	.36000
4	¼	.04016	.08031	.12047	.16062	.20078	.24094	.28109	.32125	.36141
4	½	.04031	.08062	.12094	.16125	.20156	.24188	.28219	.32250	.36281
4	¾	.04047	.08094	.12141	.16188	.20234	.24281	.28328	.32375	.36422
4	1	.04062	.08125	.12188	.16250	.20312	.24375	.28438	.32500	.36562
4	1¼	.04078	.08156	.12234	.16312	.20391	.24469	.28547	.32625	.36703
4	1½	.04094	.08188	.12281	.16375	.20469	.24562	.28656	.32750	.36844
4	1¾	.04109	.08219	.12328	.14438	.20547	.24656	.28766	.32875	.36984
4	2	.04125	.08250	.12375	.16500	.20625	.24750	.28875	.33000	.37125
4	2¼	.04141	.08281	.12422	.16562	.20703	.24844	.28984	.33125	.37266
4	2½	.04156	.08312	.12469	.16625	.20781	.24933	.29094	.33250	.37406
4	2¾	.04172	.08344	.12516	.16688	.20859	.25031	.29203	.33375	.37547
4	3	.04188	.08375	.12562	.16750	.20938	.25125	.29312	.33500	.37688
4	3¼	.04203	.08406	.12609	.16812	.21016	.25219	.29422	.33625	.37828
4	3½	.04219	.08438	.12656	.16875	.21094	.25312	.29531	.33750	.37969
4	3¾	.04234	.08469	.12703	.16938	.21172	.25406	.29641	.33875	.38109
4	4	.04250	.08500	.12750	.17000	.21250	.25500	.29750	.34000	.38250
4	4¼	.04266	.08531	.12797	.17062	.21328	.25594	.29859	.34125	.38391
4	4½	.04281	.08562	.12844	.17125	.21406	.25688	.29969	.34250	.38531
4	4¾	.04297	.08594	.12891	.17188	.21484	.25781	.30078	.34375	.38672

Lbs.	Ounces	PRICE PER POUND .01	.02	.03	.04	.05	.06	.07	.08	.09
4	5	.04312	.08625	.12938	.17250	.21562	.25875	.30188	.34500	.38812
4	5¼	.04328	.08656	.12984	.17312	.21641	.25969	.30297	.34625	.38953
4	5½	.04344	.08688	.13031	.17375	.21719	.26062	.30406	.34750	.39094
4	5¾	.04359	.08719	.13078	.17438	.21797	.26156	.30516	.34875	.39234
4	6	.04375	.08750	.13125	.17500	.21875	.26250	.30625	.35000	.39375
4	6¼	.04391	.08781	.13172	.17562	.21953	.26344	.30734	.35125	.39516
4	6½	.04406	.08812	.13219	.17625	.22031	.26438	.30844	.35250	.39656
4	6¾	.04422	.08844	.13266	.17688	.22109	.26531	.30953	.35375	.39797
4	7	.04438	.08875	.13312	.17750	.22188	.26625	.31062	.35500	.39938
4	7¼	.04453	.08906	.13359	.17812	.22266	.26719	.31172	.35625	.40078
4	7½	.04469	.08938	.13406	.17875	.22344	.26812	.31281	.35750	.40219
4	7¾	.04484	.08969	.13453	.17938	.22422	.26906	.31391	.35875	.40359
4	8	.04500	.09000	.13500	.18000	.22500	.27000	.31500	.36000	.40500
4	8¼	.04516	.09031	.13547	.18062	.22578	.27094	.31609	.36125	.40641
4	8½	.04531	.09062	.13594	.18125	.22656	.27188	.31719	.36250	.40781
4	8¾	.04547	.09094	.13641	.18188	.22734	.27281	.31828	.36375	.40922
4	9	.04562	.09125	.13688	.18250	.22812	.27375	.31938	.36500	.41062
4	9¼	.04578	.09156	.13734	.18312	.22891	.27469	.32047	.36625	.41203
4	9½	.04594	.09188	.13781	.18375	.22969	.27562	.32156	.36750	.41344
4	9¾	.04609	.09219	.13828	.18438	.23047	.27656	.32266	.36875	.41484
4	10	.04625	.09250	.13875	.18500	.23125	.27750	.32375	.37000	.41625
4	10¼	.04641	.09281	.13922	.18562	.23203	.27844	.32484	.37125	.41766
4	10½	.04656	.09312	.13969	.18625	.23281	.27938	.32594	.37250	.41906
4	10¾	.04672	.09344	.14016	.18688	.23359	.28031	.32703	.37375	.42047
4	11	.04688	.09375	.14062	.18750	.23438	.28125	.32812	.37500	.42188
4	11¼	.04703	.09406	.14109	.18812	.23516	.28219	.32922	.37625	.42328
4	11½	.04719	.09438	.14156	.18875	.23594	.28312	.33031	.37750	.42469
4	11¾	.04734	.09469	.14203	.18938	.23672	.28406	.33141	.37875	.42609
4	12	.04750	.09500	.14250	.19000	.23750	.28500	.33250	.38000	.42750
4	12¼	.04766	.09531	.14297	.19062	.23828	.28594	.33359	.38125	.42891
4	12½	.04781	.09562	.14344	.19125	.23906	.28688	.33469	.38250	.43031
4	12¾	.04797	.09594	.14391	.19188	.23984	.28781	.33578	.38375	.43172
4	13	.04812	.09625	.14438	.19250	.24062	.28875	.33688	.38500	.43312
4	13¼	.04828	.09656	.14484	.19312	.24141	.28969	.33797	.38625	.43453
4	13½	.04844	.09688	.14531	.19375	.24219	.29062	.33906	.38750	.43594
4	13¾	.04859	.09719	.14578	.19438	.24297	.29156	.34016	.38875	.43734
4	14	.04875	.09750	.14625	.19500	.24375	.29250	.34125	.39000	.43875
4	14¼	.04891	.09781	.14672	.19562	.24453	.29344	.34234	.39125	.44016
4	14½	.04906	.09812	.14719	.19625	.24531	.29438	.34344	.39250	.44156
4	14¾	.04922	.09844	.14766	.19688	.24609	.29531	.34453	.39375	.44297
4	15	.04938	.09875	.14812	.19750	.24688	.29625	.34562	.39500	.44438
4	15¼	.04953	.09906	.14859	.19812	.24766	.29719	.34672	.39625	.44578
4	15½	.04969	.09938	.14906	.19875	.24844	.29812	.34781	.39750	.44719
4	15¾	.04984	.09969	.14953	.19938	.24922	.29906	.34891	.39875	.44859
5	--------	.05000	.10000	.15000	.20000	.25000	.30000	.35000	.40000	.45000

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